Exploring the Algerian English pre-service Teachers' Attitudes towards Computer-based Teaching in Implicit Grammar Instruction

استكشاف قناعات أساتذة ما قبل الخدمة حول تعليم قواعد اللغة الإنكليزية الضمنية باستعمال معدات الكمبيوتر

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- Abstract : This study aimed at exploring pre-service teachers' attitudes towards computer-based teaching in implicit grammar instruction. It provided a general overview of the teachers' readiness of using technology in teaching English components in general and grammar pedagogy in particular. Moreover, it intended to assess 4 factors mentioned in previous literature (time limitation, lack of training and competence, teachers' beliefs and confidence) that might influence our teachers' attitudes towards the use technology in their classrooms. Using a survey questionnaire, 36 pre-service teachers responded to the questions of the instruments. The study relies on a questionnaire as the main data collection instrument The questionnaire was administered to a sample of pre-service English language teachers at University of Ghardaia. In this study, the participants did not show lack of confidence and readiness as they did not reveal their requirement for adequate training and competencies. Unexpectedly, findings showed other factors that might hinder teachers from exploiting technology in teaching grammar in their own classes. Recommendations for policy makers and teachers are discussed in this article.

Keywords: attitudes; computer-based teaching; implicit grammar; pre-service

Abstract in Arabic:

- الملخص: هدفت هذه الدراسة إلى استكشاف مواقف المعلمين قبل الخدمة تجاه التدريس القائم على الكمبيوتر في تعليم القواعد الضمنية .وقدمت لمحة عامة عن استعداد المعلمين لاستخدام التكنولوجيا في تدريس مكونات اللغة الإنجليزية بشكل عام وعلم أصول التدريس النحوي بشكل خاص .علاوة على ذلك، كانت تهدف إلى تقييم 4 عوامل مذكورة في الأدبيات السابقة (محدودية الوقت، ونقص التدريب والكفاءة، ومعتقدات المعلمين وثقتهم) التي قد تؤثر على مواقف مدرسينا تجاه استخدام التكنولوجيا في فصولهم الدراسية .باستخدام استبيان مسح، أجاب 36 معلمًا قبل الخدمة على أسئلة الأدوات .أفاد 20 منهم أن استخدام التكنولوجيا المرتبطة بالحاسوب لم يكن ضروريًا في تدريس القواعد بشكل ضمني بينما أظهر 16 مشاركًا مواقف إيجابية تجاه تعليم القواعد الضمني من خلال التدريس المعتمد على الكمبيوتر .في هذه الدراسة، لم يُظهر المشاركون نقصًا

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في الثقة والاستعداد لأنهم لم يكشفوا عن متطلباتهم للتدريب والكفاءات الكافية .كشفت الدراسة عن بعض العوامل التي قد تعيق المعلمين من استغلال التكنولوجيا في تدريس قواعد اللغة في فصولهم الخاصة .تمت مناقشة التوصيات لصانعي السياسات والمعلمين في هذه المقالة.

- **الكلمات المفتاحية :**قناعات ;التدريس القائم على الكمبيوتر;القواعد الضمنية ;قبل الخدمة.

- Introduction:

Teaching English as a second language or as a foreign language has been affected by adopting various and challenging methods. Grammar instruction, for example, has been influenced by the implementing of traditional and modern approaches such as structural and communicative ones to teach English in educational settings. In most communicative curricula, teachers are supposed to instruct grammar implicitly, inductively and within a meaningful context to enable learners to use the linguistic competence in real life situations. Additionally, teachers are recommended to incorporate technology (e.g. computer- based technology) to achieve better learning results.

However, certain teachers were often observed reluctant to use computer-based method or ICT method in teaching English in general and in teaching grammar in particular. Some of the teachers seemed to use technology in classrooms only to motivate students at the beginning of the class, but the main following learning tasks were supposed accomplished in "archaic" (void of technology use) or traditional manner.

To understand the reasons behind teachers' avoidance of integrating computer-based teaching in their classes, pre-service teachers' attitudes towards the use of technology in their future classes were under investigation in this study, with particular regards to the instruction of grammar in implicit manner.

Additionally, the purpose of this study was to gain a comprehensive picture of the challenging process of teaching grammar using computer-based technology meaningfully. Pre-service teachers were selected in this study to eliminate the effects of experiential and contextual factors on their attitudes, and to isolate the initial variables pre-service teachers tend to hold before attending classes. Conducting this study on preservice teachers' attitudes might be necessary to prepare more competent teachers (Kahn, Lindstrom, & Murray, 2014). Preceding researchers (e.g.: Teo, 2012) warned that the results of previous studies were different and they might not be generalised in different cultures and societies. Therefore, this study aims to explore preservice teachers attitudes regarding the use of technology in a specific area (grammar instruction) to fill the gap left in literature.

1. Research Questions:

This study is guided by two main research questions:

a. What attitudes pre-service teachers hold about the use of computer-based teaching in teaching grammar implicitly in their future classrooms?

b. What are the factors that might hinder pre-service teachers from implementing computer-based teaching in their own classrooms?

2. Literature Review:

The widespread of information and communication technologies (ICT) has obviously changed the nature of education. English teaching and learning are not exception from this movement as the use of ICT in EFL classrooms has recently enjoyed much interest among practitioners. Teachers' tendency to adopt certain methods is generally based on the nature of beliefs and attitudes the teachers hold when they come to classes. If EFL teachers do not believe in ICT method in teaching grammar, for instance, they will likely to be reluctant to integrate technology in classroom events. Perhaps the attitudes held by pre-service teachers are more influential and dominant than the attitudes received during or after practicing teaching, for the fact that the new attitudes which come as a result of experience are deemed easy to change if the contextual variables change. However, pre-service teachers might hold such natural and deep-rooted attitudes that may be closely associated with their personality, feeling and emotions. Therefore, there is a need to explore the attitudes pre-service teachers have before being in charge of teaching a subject. Modelling the pre-service beliefs towards the use of ICTs in implicit grammar instruction might inform about the features of the training that they need to take before teaching. Improving the quality of training for pre-service teachers might make the process of EFL teaching in general and implicit grammar in particular successful in practice.

1.1. Challenges of ICTs Integration in EFL Classrooms

EFL teachers in different parts of the world are often encouraged to use technology to improve their learners' performance. However, certain teachers experience difficulties that tend to prevent them from ripping the full benefit from using ICT in their classrooms. In this respect, both external and internal factors appear to obstruct EFL teachers from integrating ICT into language instruction (Dang, 2011). The internal challenges involve teacher-related factors such as teachers' attitudes toward ICTs and their understanding of the skills involved, while external challenges refer to the contextual factors such as the availability of technological devices in educational institutions and technical support (Nim Park & Son, 2009). These challenges might complicate the reality of ICTs classrooms and raise doubts about the success of ICT in EFL classrooms (Woollard, 2007). Pre-

service teachers' attitudes towards the use of ICTs are affected by certain factors. Literature documents some internal and external factors that might discourage teachers to use computer-based teaching. Here are some of them:

1.1.1. Teachers' Beliefs on ICT

There is a general consensus that the beliefs and perceptions teachers hold might inform their instructional practices and classroom decisions (Pajares, 1992). Therefore, the attitudes towards ICTs inclusion in EFL teaching are deemed to be affected by the teachers' personal theories and understanding of using technology in their own educational contexts. Teachers' attitudes towards ICTs use in teaching are among the internal forces which may influence implementation of the latter (Pardede, 2020). Manipulating teachers' practices of computer-based teaching is a challenging matter and time consuming but it requires from them to find the ICT method beneficial to their students' learning (Wikan, & Molster, 2011). Exploring teachers' attitudes might predict teachers' readiness to use technology and uncover the reasons behind teachers' resistance to using ICT in teaching.

1.1.2. Time Limitation

Some EFL teachers are reluctant to use computer-based teaching as it might consume much time allocated to the lesson. It has been stated that lack of time is a common issue in the implementation of computer-based instruction (Al Mulhim, 2014; Raman and Yamat, 2014). Nim Park and Son (2009) confirm that time constraint is among the external factors that discourage educators to integrate ICT in their own classrooms. However, the effective use of electronic aids might save time and labour and might help both teachers and learners on the same time to reach the end of the course successfully (Mathew & Alidmat, 2013).

1.1.3. Confidence in ICT Use

Teachers' confidence in ICT might encourage teachers to use technology in their classroom (Wikan & Molster, 2011). Moreover, teacher confidence affects both teachers' and learners' use of computer-based instruction (Jamieson-Proctor, Burnett, Finger and Watson 2006). "Teachers who were not confident users of ICT would employ another adult to help and direct the children with ICT and hence not use ICT in any way to change pedagogy" (Bold, 2004, p. 51). Ross, Hogaboam-Gray & Hannay (1999) noted that pedagogical beliefs and teaching experience are major factors that weaken teachers' confidence in adopting ICT in their classes.

1.1.4. Lack of Training and Competence

One of the universal problems in using technology in EFL teaching and learning is teachers' luck of competence in ICT management (Al Mulhim, 2014). Teachers' luck of training to use

technology in EFL classes is one of the noteworthy problems that need to be taken into account before the implementation of ICT in EFL classrooms (Cakici, 2016). The lack of competence and computer skills make teachers feel uncomfortable while using ICT in their classes (Raman and Yamat, 2014). Both cognitive and technical skills and abilities are required for teachers to use, develop and exchange thoughts communicatively (Asian Development Bank, 2009). Besides, teachers' computer skills are supposed to be behind the success of ICT use in their instructional practices (Wikan & Molster, 2011). Teachers' failure to exploit ICT in EFL classes might be due to the poor quality of training they attained (Le Thi, 2020). Nim Park & Son (2009) suggested that teachers need professional development and an effective training for the success of computer –assisted classrooms. Previous studies have determined a set of factors (teachers' beliefs on ICT, time limitation, confidence in ICT use, and lack of training and competence) that might prevent teachers from integrating technology into educational settings and classrooms. However, replicating the previous studies on technology use in a specific sample (EFL pre-service teachers) in a particular area (implicit grammar instruction) might help re-examine the factors and provide additional information concerning the effects of the aforementioned challenges in our context.

2. Method

This study aimed to collect data about the use of technology in teaching English in general and in grammar classes in particular from a sample of pre-service teachers. SPSS was used to analyse the data collected.

2.1. Participants:

This study recruited 36 pre-service teachers from a teacher education master's degree program. Their ages ranged from 21 to 33 years old. They enrolled in post-graduation training at university of Ghardaia, south of Algeria. The sample involved 8 males and 28 females. All the participants had little or no experience in teaching in either public or private institutions. The participants were given questionnaires to fill in no more than 10 minutes. Table 1 below describes statistically gender and age of the sample.

Table 1: Demographic variables

age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-27	28	77.8	77.8	77.8
	28-33	8	22.2	22.2	100.0
	Total	36	100.0	100.0	

gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	8	22.2	22.2	22.2
	female	28	77.8	77.8	100.0
	Total	36	100.0	100.0	

Table 1 : Demographic variables for preservice teachers (N° =36)

2.2. Instrument

A questionnaire was designed to collect information about the demographic variables and the contributing factors associated with the sample. The questionnaire consisted of the demographic section, contributing factors and an open-ended question. The demographic section was linked to the participants age and gender. The contributing factors section contained a Likert scale table. The table involved 4 items (1= strongly disagree; 2= disagree; 3= agree; 4= strongly agree). The table consisted of 4 statements designed to explore the factors behind pre-service teachers' unwillingness to use computer- based method in teaching implicit grammar in their future classes.

The first statement was purposely designed to measure their beliefs, attitudes and opinions (belief factor) about the efficacy of using computer accessories in teaching grammar implicitly. Statement 2 was meant to investigate whether the classroom timing was a challenging factor (time factor) for teachers to use computer in teaching English in general and in implicit grammar instruction in particular.

Statement 3 was designed to measure the level of their confidence (confidence factor) to integrate technology and computer-based instruction. Statement 4 was intended to gather data on pre-service teachers' requirement for an adequate training (training factor) to use technology in their classes successfully.

All the four statements were designed to re-examine the impact of the four previously mentioned factors in the review of literature of this paper on teachers' decision to use technology in grammar instruction. The results might help confirm previous research, reorder the effective forces according to their strength, or to isolate the irrelevant factors that had nothing to say in our context. Furthermore, teachers training would possibly be successful if it took much consideration to the significant factors that hinder teachers to use computer in EFL teaching and learning.

An open-ended question in the second part was put at the end of the survey. The participants were asked to suggest the reasons behind teachers' avoidance to incorporate computer -related technology in EFL classroom. The qualitative data emerging from this question might help stakeholders understand the factors and prepare the appropriate context where in-service teacher instruct English proficiently. The conclusions might inform the quality of training preservice teachers require to take before attending classes.

The open-ended question was meant to support and understand the quantitative data, to clarify possible ambiguity in the results, and to enrich literature with additional information in this area.

After gathering the questionnaires from the participants, the data were entered into SPSS for statistical analysis.

3. Results

To gain a general overview of pre-service teachers' attitudes towards the use of computer-based method in teaching grammar implicitly, 36 pre-service teachers were asked certain questions. No significant relationship was found between the demographic variables (age and gender) and each of the contributing factors in this study.

In order to measure the pre-service teachers' beliefs (the belief factor) on the importance of computer-related technology in implicit grammar instruction, the participants were asked statement1 below. More than half the respondents 20 (5.55 % + 50 % = 55%) reported that they believed that the use of computer-related technology was not necessary in teaching grammar implicitly. 16 participants (44.44%) believed that technological method was necessary in formal instruction.

So as to explore the effect of time (time factor) on the pre-service teachers' attitudes, they were asked statement 2. Results showed that nearly two thirds of the respondents 22 (52.77+ 8.33 %) agreed that the time factor had something to say on the issue of teaching grammar in their future classes. However, 14 participants (33.33 + 5.55 %) stated that the time devoted to lessons was sufficient to use computer- based teaching.

To investigate the extent to which the preservice teachers were confident (confidence factor) is implementing different technological devices in their future classrooms, they were asked statement 3. The majority (30) of the participants 83.33% (58.33+25 %) reported that they were able to use the computer-related technologies without need the intervention from others. However, only 6 participants confessed that they were still unconfident to use computer accessories and needed support and help in computer-based classrooms.

Concerning the training and competence factor, the pre-service teachers in this study were asked if they thought that they would not use computer- related technology to teach grammar meaningfully as they believed that they lacked the adequate training. Three quarters of the participants (47.22 + 27.77 % = 75%) reported that they tended not to require training to use computer-based teaching in implicit grammar instruction. Nevertheless, 25% confessed that they required training and professional development to implement the technological method in teaching grammar implicitly, inductively and communicatively.

Table 2: Items in pre-service teachers' attitudes towards computer-based teaching

	Statements	I strongly disagree 1	I disagree 2	I agree 3	I strongly agree 4
1	I believe that computer- related technology is not necessary in teaching grammar implicitly. I think that pupils will learn grammar better if they were taught in traditional manner	2 5.55 %	**18** **50 %**	**16** **44.44%**	0 **00%**
2	During grammar lessons, computer based teaching is supposed to be time consuming. The lesson timing is not sufficient to use computer –based teaching in implicit grammar instruction.	2 **5.55%**	12 **33.33%**	**19** **52.77%**	3 **8.33%**
3	I will be able to use the computer accessories successfully in my classroom without need help from others.	1 **2.77%**	5 **13.88%**	**21** **58.33%**	9 **25%**
4	I think I will not use computer- related technology in teaching grammar meaningfully because I lack the adequate training to use it.	10 **27.77%**	**17** **47.22%**	7 **19.44%**	2 **5.55%**

Table2: Items in pre-service teachers' attitudes towards computer based teaching

On the basis on SPSS results analysis (Table 3), we summarise the following insights into implicit grammar instruction through computer- based teaching. In general, although the sample showed that they were relatively confident as the mean score was above the mid-point of the scale (Mean= 3.05), and they reported that they required not training (Mean = 2.0) to use computer-based teaching, they believed that computer- related technology was not necessary in teaching grammar implicitly (Mean= 2.3, SD = 0.63) above the mid-point scale. They agreed as well that time was the most crucial factor that tended to challenge them (Mean = 2.6) to use the technological method successfully in EFL teaching in general and grammar instruction in particular.

Table 3: Descriptive Statistics of the Four Items

	Mean	Std. Deviation	N
belief	**2.3611**	.63932	36
training	2.0278	.84468	36
confidence	**3.0556**	.71492	36
time	**2.6389**	.63932	36

In order to check the interrelationship between the four factors, SPSS showed poor or no significant correlation between each of the four items (Table 4). It indicated that the four factors were not inherently interwoven and the factors were independent variables. It meant as well that their self- reported beliefs regarding the effectiveness of computer- based instruction on implicit grammar instruction were not shaped by the effects of time limitation, lack of confidence or training. It implied that the nature of their beliefs concerning computer-based teaching in implicit grammar instruction was derived from extra unstated factors. Therefore, an open-ended question was designed to discover the additional variables behind pre-service teachers' negative attitudes towards the use of ICT in EFL teaching and grammar pedagogy.

Table 4 : **Inter-Item Correlation Matrix**

	belief	time	confidence	training
belief	1.000	-.021-	.142	.140
time	-.021-	1.000	-.330-	.284
confidence	.142	-.330-	1.000	-.381-
training	.140	.284	-.381-	1.000

4. Discussion

The study intended to reveal specific information about beliefs held by pre-service teachers about computer- based technology use in teaching grammar meaningfully. It aimed at predicting the challenges pre-service teachers might encounter when they intend to integrate technology into their future classes. The results showed no significant correlation between the demographic variables (age and gender) and attitudes towards the use of technology in grammar pedagogy.

The results showed that the effectiveness of computer- based method in implicit grammar instruction was a controversial issue among the participants since a considerable number of them (55.55%) believed that the method was unnecessary in grammar instruction. It was clear the sample split into two nearly equal groups in terms of giving importance to technology in grammar pedagogy, but it could not be guaranteed that the results might remain the same in teaching vocabulary or English language teaching in general. In any case, the results of this study were different from Teo's (2008) that found that the overall participants (pre-service teachers in a Singapore university) revealed positive attitudes towards the computer use. Teo (2008) attributed the positive level of computer attitudes to the accessibility and availability of computers provided to the participants in different stages. Likewise, the low level of positive attitudes towards computer- based teaching was owing to the low level of our pre-service teachers' accessibility to computers might be due to the lack of availability of computers in the current institutions. Moreover, the group of participants in this study who showed a negative level of attitudes might believe that significance of computer-based is limited to developing certain skills such as listening and speaking, as they were not necessary and needed in grammar instruction. It is worth mentioning, that Leo's (2008) sample involved graduates in science in Technical University, and a few of them were graduates in English language and literature. Perhaps the differences in results were due to contextual factors.

The findings showed that nearly two thirds of the respondents agreed that pre-service teachers might avoid using computer-based teaching due to time limitation in their classes. The results supported the previous studies (e.g: Nim Park & Son, 2009; Al Mulhim, 2014; Raman and Yamat, 2014) which confirmed that the time factor was among the external factors that might hinder

teachers to implement computer use in classrooms. In this respect, the teachers needed to be trained to manage time or to believe that the time devoted to classes was sufficient if it was spent properly.

The majority of the sample showed high level of confidence in computer and technology use in EFL classes. It indicated the negative attitudes towards the use of technology computer – based instruments and implicit grammar pedagogy were not due to the low level of confidence as noted in previous literature. In this respect, our sample appeared confident to use technology and they showed that they were able to make the implementation of computer- based teaching successful in practice.

Regarding training and competency, three quarters of the participants in this study reported that they did not lack training or competence to use the computer appropriately. This demonstrated that certain pre-service teachers did not avoid using computer- based instruction due to training or ability issues. The findings were in agreement with previous results (e.g.: Raman and Yamat, 2014) which insisted that lack of computer ability and competencies might make teachers not ready to use ICT comfortably in teaching and learning situations. In this study, the participants did not show lack of confidence and readiness as they did not reveal their needs for adequate training and competencies.

It appeared that the pre-service teachers' attitudes towards the use of technology in grammar classes were not strongly affected by the time factor. Besides, confidence and training factors recorded little or no effect on the pre-service teachers' attitudes towards the use of computer based teaching in implicit grammar instruction in particular. This demonstrated that the four items in the questionnaire were independent variables. It was clear that the sample generally tended to believe that the computer- based method was unnecessary in implicit grammar classrooms, and this orientation was not directly linked with time, confidence and training factors (Table 4). Yet, it seemed necessary to explore and investigate the hidden reasons that informed such negative beliefs and attitudes.

Consequently, the pre-service teachers in this study were asked an open –ended question on the reasons behind teachers' avoidance to use computer- based teaching in implicit grammar instruction. The responses to the open-ended question inspired the following reasons:

1- Computer based teaching **distract** learners as they focus on visual or sound effects (colour and music), and they lose **concentration** on the lesson itself (e.g.: Teacher 7, Teacher 12, Teachers 21).
2- Teachers prefer traditional methods as some of teachers doubt the **effectiveness** of the modern ones (e.g.: Teacher2, Teacher 8, Teacher 9, Teacher 20).

3- They avoid it because technological means are not always **available** (e.g.: Teacher1, Teacher 27).

Apart from the issue of availability of technological devices in educational settings, it can be concluded that certain teachers resist change and innovation in EFL teaching as they are uncertain about the effectiveness of computer- based teaching in EFL in grammar pedagogy in particular. Therefore, I recommend conducting research within a larger sample or conducting an experimental study using a pre-test, post-test design to examine the effects of computer-based treatment on the instruction of grammar meaningfully. The research outcomes might change or confirm both pre-service and in-service teachers' attitudes and classroom implementation of ICT method in implicit grammar pedagogy. We need as well to involve the new factors discovered by the open-ended question in this study such as learners' concentration and technology availability factors in educational institutions to reorder the factors and treat them according to their priority in teacher education and professional development.

5. Conclusion

Under the light of this study, policy makers are recommended to provide EFL teachers with computer –related technologies in their own classrooms in order not to waste time in technology management and instruments installation. A high-quality training on how to manage time during technology use is required by EFL teachers. They require training on how to use technology in proper manner without distracting learners' attention or decreasing their achievement. Teachers are recommended to read pieces of research on the effectiveness of technology in EFL teaching and grammar instruction in particular.

- References:

- Al Mulhim, E. (2014). The Barriers to the Use of ICT in Teaching in Saudi Arabia: A Review of Literature. Universal Journal of Educational Research, 2(6), 487-493.

- Cakici, D. (2016). The use of ICT in teaching English as a foreign language. Participatory Educational Research, 4(2), 73-77.

- Dang, X. T. (2011). Factors influencing teachers' use of ICT in language teaching: A case study of Hanoi University, Vietnam. In International Conference "ICT for Language Learning" 4th edition, Simonelli Editore, 20th-21st October.

- Kahn, L. G., Lindstrom, L., & Murray, C. (2014). Factors contributing to preservice teachers' beliefs about diversity. Teacher Education Quarterly, 41(4), 53-70.

- Le Thi, M. A. I. (2020). Benefits and challenges to integrate ICT in EFL teaching and learning activities. Journal of Research & Method in Education (IOSR-JRME), 10(3), 46-50.

- Nim Park, C., & Son, J. B. (2009). Implementing computer-assisted language learning in the EFL classroom: Teachers' perceptions and perspectives. International Journal of Pedagogies and Learning, 5(2), 80-101.

- Pajares, F. (1992). Teachers' Beliefs and Educational Research: Cleaning up a Messy Construction. Review of Educational Research, 62 (13), 307-332.

- Pardede, P. (2020). Secondary School Students' Perception of ICT Use in EFL Classroom. JET (Journal of English Teaching), 6(3), 246-259.

- Raman, K., &Yamat, H. (2014). Barriers teachers face in integrating ICT during English lessons: A case study. Malaysian Online journal of educational technology, 2(3), 11-19.

- Ross, J. A., Hogaboam-Gray, A., &Hannay, L. (1999). Predictors of teachers' confidence in their ability to implement computer-based instruction. Journal of Educational Computing Research, 21(1), 75-97.

- Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. Australasian Journal of Educational Technology, 24(4).

- Wikan, G. & Molster, T. (2011). Norwegian secondary school teachers and ICT.European Journal of Teacher Education, 34(2), 209-218.

- Woollard, J. (2007). Achieving QTS: Learning and Teaching Using ICT in Secondary Schools. Exeter : *Learning* Matters Ltd.